

## References:

- Ackermann, A. 1967. Quantitative Untersuchungen an Körnerfressenden Singvögeln. *Journ. f. Orn.* 108: 430-473.
- Amadon, D. 1950. The Hawaiian honeycreepers (Aves, Drepaniidae). *Bull. Amer. Mus. Nat. Hist.* 95: 151-262.
- Beecher, W. J. 1953. A phylogeny of the oscines. *Auk* 70: 270-333.
- Bock, W. J. 1972. Morphology of the tongue apparatus of *Ciridops anna* (Drepaniidae). *Ibis* 114: 61-78.
- Foelix, R. F. 1970. Vergleichend-morphologische Untersuchungen an den Speicheldrüsen Körnerfressender Singvögel. *Zool. Jahrb., Anat.* 87: 523-587.
- Mayr, E. & Amadon, D. 1951. A classification of recent birds. *Amer. Mus. Novit.* 1496.
- Mayr, E., Andrew, R. J. & Hinde, R. A. 1956. Die systematische Stellung der Gattung *Fringilla*. *Journ. f. Orn.* 97: 258-273.
- Morony, J. J. Jr., Bock, W. J. & Farrand, J. Jr. 1975. Reference list of the birds of the world. *Amer. Mus. Nat. Hist.*
- Peters, J. L. 1962. *Check-list of Birds of the World, vol. 15* (E. Mayr & J. C. Greenway, Jr., Eds.). Cambridge, Mass.: Mus. Comp. Zool.
- 1968. *Check-list of Birds of the World, vol. 14* (R. A. Paynter, Jr., Ed.). Cambridge, Mass.: Mus. Comp. Zool.
- 1970. *Check-list of Birds of the World, vol. 13* (R. A. Paynter, Jr., Ed.). Cambridge, Mass.: Mus. Comp. Zool.
- Raikow, R. J. 1977. The origin and evolution of the Hawaiian honeycreepers (Drepaniidae). *The Living Bird, 15th annual*: 95-117.
- Rand, A. L. 1955. The origin of the land birds of Tristan da Cunha. *Fieldiana: Zool.* 37: 139-166.
- Richards, L. P. & Bock, W. J. 1973. Functional anatomy and adaptive evolution of the feeding apparatus in the Hawaiian honeycreepers genus *Loxops* (Drepaniidae). *Orn. Monographs* 15. *Amer. Orn. Union.*
- Ridgway, R. 1901. Birds of North and Middle America, pt. 1. *Bull. U.S. Nat. Mus.* 50.
- Sushkin, P. P. 1924. [On the Fringillidae and allied groups.] *Bull. Brit. Orn. Club* 45: 36-39.
- 1927. On the anatomy and classification of the weaver-birds. *Bull. Amer. Mus. Nat. Hist.* 72: 1-32.
- 1929. On the systematic position of the Drepanidae. *Verb. 6th Internat. Orn. Kongr., Kopenhagen, 1926*: 379-381.
- Taka-Tsukasa, N. & Hachisuka, W. V. 1925. A contribution to Japanese ornithology. *Ibis*: 898-908.
- Tordoff, H. B. 1954. A systematic study of the avian family Fringillidae based on the structure of the skull. *Misc. Pub. Mus. Zool., U. Michigan* 81.
- Vaurie, C. 1956. Systematic notes on Palearctic birds. No. 20 Fringillidae: the genera *Leucosticte*, *Rhodopechys*, *Carpodacus*, *Pinicola*, *Loxia*, *Uragus*, *Urocynchramus*, and *Propyrrhula*. *Amer. Mus. Novit.* 1786.
- Ziswiler, V. 1965. Zur Kenntnis des Samenöffnens und der Struktur des hörnernen Gaumens bei körnerfressenden Oscines. *Journ. f. Orn.* 106: 1-48.
- 1967. Vergleichend morphologische Untersuchungen am Verdauungstrakt körnerfressenden Singvögel zur Abklärung ihrer systematischen Stellung. *Zool. Jahrb., Syst.* 94: 427-520.

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## An analysis of avian stomach contents from southern Africa

by W. R. J. Dean

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The standard reference books on African birds give generalised statements about the diet of most birds, but for few of them are the arthropod orders and families eaten identified.

From June 1972 to July 1973 a number of birds were collected in South

West Africa, South Africa and Rhodesia as part of a research project on the blood and eye-lens proteins of birds. Stomach contents from some of these specimens, and from road casualties, were preserved, and have now been analysed. Most specimens were dissected shortly after collection and the contents of the gizzard and crop were preserved in 70% ethanol. However, in a number of cases, the time lag between collection and dissection was sufficient for friable and small food items to digest or become anonymous.

The stomach contents of each specimen are given in Table 1. None of the identifications was unexpected or unusual, but as noted earlier, there are few comparative data.

Avian nomenclature follows McLachlan & Liversidge (1970) and insect taxonomy follows Smart (1962).

TABLE 1

Analysis of stomach contents of birds collected in South West Africa (SWA), South Africa (SA) and Rhodesia (R), June 1972 to July 1973. Numbers indicate the number of individuals or species recognised. The stomach contents from two individuals of the same species collected at the same locality within 30 minutes of each other have been pooled.  
L=larva(e), W=worker, A=adult.

Species	Locality, Date	Order	Family	Species & Number
<i>Vanellus coronatus</i>	Kimberley, SA 4.vii.73	Isoptera	Hodotermitidae	<i>Hodotermes mossambicus</i> 7W
		Coleoptera	Curculionidae	3
		Coleoptera	Tenebrionidae	1
				Fragments of 4 Coleoptera spp.
<i>Cursorius rufus</i>	Kimberley, SA 3.vii.73	Hymenoptera	Formicidae	Fragments of 3 individuals
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> 20W
		Coleoptera	Curculionidae	1
<i>Cursorius rufus</i>	Kimberley, SA 5.vii.73	Hymenoptera	Formicidae	27+
		Diptera		1
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> 17W
		Coleoptera	Tenebrionidae	1
<i>Rhinoptilus africanus</i>	Kimberley, SA 2.vii.73	Isoptera	Hodotermitidae	Coleoptera fragments
		Coleoptera		<i>H. mossambicus</i> 20W
		Hymenoptera	Formicidae	Fragments
<i>Otus scops</i>	Erongo Mts., SWA 26.iv.73	Scorpionidea		Fragments
		Orthoptera	Gryllidae	1
		Coleoptera		Fragments of 3 spp.
<i>Glaucidium perlatum</i>	Erongo Mts., SWA 28.iv.73	Lepidoptera		1A, 3L
		Coleoptera		Fragments
<i>Toxokus erythrorhynchus</i>	Humani Ranch, R 27.xii.72	Solfugidea		1
<i>Toxokus erythrorhynchus</i>	Humani Ranch, R 27.xii.72	Hymenoptera	Formicidae	seeds numbers
<i>Toxokus alboterminatus</i>	Humani Ranch, R 19.xii.72	Orthoptera	Acrididae	1
		Hemiptera	Coreidae	1
		Coleoptera	Cerambycidae	1
		Orthoptera	Acrididae	7
<i>Toxokus monteiri</i>	Gamsberg, SWA 19.iv.73	Lepidoptera		1L
		Coleoptera		Fragments of 12 Large seeds
				1
<i>Indicator minor</i> Two stomachs	Erongo Mts., SWA 26.iv.73	Araneida		1
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> W
<i>Mirafra sabota</i>	Kimberley, SA 28.ii.73	Coleoptera		Fragments
		Hymenoptera	Formicidae	5
		Coleoptera		1
				seeds
<i>Mirafra apitata</i>	Kimberley, SA 4.vii.73	Isoptera	Hodotermitidae	<i>H. mossambicus</i> 10W
		Hymenoptera	Formicidae	head capsules seeds
<i>Chersomanes albofasciata</i>	Kimberley, SA 2.vii.73	Isoptera	Hodotermitidae	<i>H. mossambicus</i> 10W
		Coleoptera	Carabidae	1
		Coleoptera	Chrysomelidae	1L
		Coleoptera	Curculionidae	2
				seeds
<i>Calandrella cinerea</i>	Kimberley, SA 2.vii.73	Isoptera	Hodotermitidae	<i>H. mossambicus</i> 9W
		Hymenoptera	Formicidae	Fragments
<i>Parus afer</i>	Kimberley, SA 16.vii.73	Lepidoptera		4L
		Coleoptera		Fragments
		Hymenoptera		Fragments

TABLE 1 Continued  
Species

Species	Locality, Date	Order	Family	Species & Number
<i>Cossypha</i> <i>caffra</i> <i>Erythropygia</i> <i>paena</i>	Kimberley, SA 13.vii.73 Kimberley, SA 17.vii.73	Coleoptera		Fragments
		Hymenoptera	Formicidae	3+
		Hemiptera	Pentatomidae	10+
		Hemiptera	Lygacidae	2
		Lepidoptera		1L
		Coleoptera	Curculionidae	1
		Coleoptera	Ptilidae	1
		Hymenoptera	Formicidae	3
<i>Farisoma</i> <i>subcaeruleum</i>	Kimberley, SA 1.iii.73	Araneida		seeds
		Lepidoptera		1
<i>Eremomela</i> <i>icteropygialis</i>	Kimberley, SA 17.vii.73	Hymenoptera	Formicidae	5L, 2 spp.
		Hemiptera	suborder Homoptera	4
		Lepidoptera		1
<i>Malcorus</i> <i>pectoralis</i> Two stomachs	Kimberley, SA 6.vi.72	Hemiptera		1L
		Coleoptera		Fragments
		Coleoptera	Curculionidae	Fragments
<i>Malcorus</i> <i>pectoralis</i> Two stomachs	Kimberley, SA 18.vii.73	Isoptera	Hodotermitidae	<i>H. mossambicus</i> 3W
		Hemiptera	Pentatomidae	3
		Coleoptera	Curculionidae	2, 2 spp.
		Coleoptera		Fragments
<i>Malcorus</i> <i>pectoralis</i>	Kimberley, SA 19.vii.73	Hymenoptera	Formicidae	3
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> 6W
		Lepidoptera		2L
<i>Cisticola</i> <i>aridula</i>	Kimberley, SA 19.vii.73	Coleoptera		Fragments
		Araneida		2
		Orthoptera		Fragments
		Hemiptera	suborder Homoptera	
		Hemiptera	Jassidae	3
<i>Prinia</i> <i>flavican</i>	Kimberley, SA 6.vi.72	Hemiptera	suborder Homoptera	3
		Hemiptera	suborder Heteroptera	2
		Diptera	suborder Nematocera	1
		Araneida		1
		Hemiptera	suborder Heteroptera	12
		Hemiptera	Pentatomidae	12
		Lepidoptera		4L
		Coleoptera		Fragments
<i>Prinia</i> <i>flavican</i>	Kimberley, SA 17.vii.73	Hymenoptera	superfamily Chalcidoidea	1
				2
		Hemiptera	Lygacidae	Fragments
		Coleoptera	Coccinellidae	1
		Coleoptera		Fragments
		Hymenoptera	Formicidae	Fragments
		Pseudoscorpionida		1
		Hemiptera		1
		Coleoptera		1
		Hymenoptera	Chalcidoidea	1
<i>Bradornis</i> <i>infuscatus</i> Two stomachs	Kimberley, SA 18.vii.73	Hymenoptera		Fragments
		Diptera		10+
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> 26W
		Hemiptera		Fragments
		Coleoptera		Fragments
		Hymenoptera	Formicidae	<i>Messor</i> spp. + 1 other genus
		Orthoptera	Acrididae	1
		Hemiptera	Coreidae	1+
		Hemiptera	Pentatomidae	17
		Lepidoptera		1A
<i>Anthus</i> <i>novaezeelandiae</i> Two stomachs	Kimberley, SA 11.vii.73	Coleoptera	Chrysomelidae	1
		Coleoptera		Fragments of 6+ spp.
		Hymenoptera		Fragments
		Isoptera	Hodotermitidae	<i>H. mossambicus</i> 16W
		Coleoptera		Fragments
		Hymenoptera	Formicidae	3+
<i>Lanius</i> <i>collaris</i>	Kimberley, SA 20.vii.73	Myriapoda		Fragments
		Coleoptera		Fragments
<i>Eurocephalus</i> <i>anguitimens</i>	Erongo Mts., SWA 25.vi.73	Isoptera	Hodotermitidae	<i>H. mossambicus</i> 19W + 1 soldier
		Coleoptera	Scarabaeidae	2
		Coleoptera		Fragments
		Hymenoptera	Formicidae	3
		Hymenoptera	Vespidae	1

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## References:

- McLachlan, G. R. & Liversidge, R. 1970. *Roberts Birds of South Africa*. Central News Agency: Cape Town.
- Smart, J. 1962. *Instructions for Collectors*. No. 4a, Insects. Trustees of the British Museum: London.
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## Remarks on the generic allocation of *Pseudochelidon sirintarae*

by R. L. Zusi

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In 1968 Kitti Thonglongya described a new swallow, *Pseudochelidon sirintarae*, from Thailand (Thonglongya 1968). Its relationship with *Pseudochelidon eurystomina* of Africa was suggested to him by similarities of plumage, bill, and feet, and by comments of Peter Ames on its syringeal structure. The syringeal structure of the 2 species of *Pseudochelidon* differed enough from that of the Hirundininae to suggest at least subfamily distinction from the true swallows (Mayr & Amadon 1951, Ames, in Thonglongya 1968). Apart from the peculiarities that link the 2 species in a subfamily of their own, Thonglongya (1968: 7) commented that "the differences in size and shape of bill, the ridge between the nasal apertures, the size and strength of the feet, and the tail racquets, coupled with the geographic separation, might suffice to separate the 2 species into different genera". He nevertheless placed *sirintarae* in *Pseudochelidon* after interpreting the evidence in line with current taxonomic trends.

Recently, Brooke (1972) discussed generic limits in Old World Apodidae and Hirundinidae. He proposed raising a number of subgenera to genera, resurrected several genera (but see Phillips 1973), and named a new genus—*Eurochelidon*—in the Pseudochelidoninae, for *sirintarae*.

The basis for Brooke's new genus was a comparison by him of the skins of both *eurystomina* and *sirintarae* at the Smithsonian Institution, and measurements of both species presented by Thonglongya. Brooke made no comment on plumage differences, but he stated that "the differences in the shape and proportions of the bill and mouth show that they have very different feeding ecologies, *sirintarae* probably being able to take much larger prey and perhaps in different microhabitats" (Brooke 1972: 55). He then justified the new genus on differences in morphology, inferred ecology, and zoogeographic region. I think the following remarks cast doubt on this decision.

According to my measurements of a skin and spirit specimen of *sirintarae* and 2 skins and a spirit specimen of *eurystomina* in the Smithsonian Institution's collections, differences in bill proportion are much less marked than indicated by Thonglongya's data. In *eurystomina* the commissure is partly obscured by feathers whereas in *sirintarae* it is entirely exposed; apparently Thonglongya measured "bill from gape" and "width at gape" from the point where feathers obscured the commissure in *eurystomina* rather than from the angle of the mouth. His measurements of *sirintarae* consequently indicate a bill "more than half as wide again at gape, (and) half as long again" as that of *eurystomina* (Thonglongya 1968: 4). My measurements of the bill of 2 skins of *eurystomina*, all taken from the angle of the mouth, are